



STIC Search Report

EIC 1700

STIC Database Tracking Number: 102835

TO: Tamra Dicus
Location:
Art Unit : 1774
September 4, 2003

Case Serial Number: 10/070110

From: John Calve
Location: EIC 1700
CP3/4-3D62
Phone: 308-4139

John.Calve@uspto.gov

Search Notes

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: TAMARA DICUS Examiner #: 79110 Date: 9/2/03
Art Unit: 1774 Phone Number 30 53809 Serial Number: 101070110
Mail Box and Bldg/Room Location: CPB/1120 Results Format Preferred (circle): PAPER DISK E-MAIL
727622

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: SEE ATTACHMENT - B/B
Inventors (please provide full names):

Earliest Priority Filing Date:

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

I'd like to find any paper, or composition that has the formula of claim 8. The process of making it is in claim 9 & I'd need it as well.
Thanks

STAFF USE ONLY		Type of Search	Vendors and cost where applicable
Searcher: Calve	NA Sequence (#)	STN	
Searcher Phone #:	AA Sequence (#)	Dialog	
Searcher Location:	Structure (#)	Questel/Orbit	
Date Searcher Picked Up: 9/3/03	Bibliographic	Dr. Link	
Date Completed: 9/4/03	Litigation	Lexis/Nexis	
Searcher Prep & Review Time: 120	Fulltext	Sequence Systems	
Clerical Prep Time:	Patent Family	WWW/Internet	
Online Time: 120	Other	Other (specify)	



STIC Search Results Feedback Form

EIC17000

Questions about the scope or the results of the search? Contact *the EIC searcher or contact:*

Kathleen Fuller, EIC 1700 Team Leader
308-4290, CP3/4-3D62

Voluntary Results Feedback Form

➤ I am an examiner in Workgroup: Example: 1713

➤ Relevant prior art **found**, search results used as follows:

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
(journal articles, conference proceedings, new product announcements etc.)

➤ Relevant prior art **not found**:

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to STIC/EIC1700 CP3/4 3D62



=> file hca

FILE 'HCA' ENTERED AT 09:22:47 ON 04 SEP 2003
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
COPYRIGHT (C) 2003 AMERICAN CHEMICAL SOCIETY (ACS)

Copyright of the articles to which records in this database refer is held by the publishers listed in the PUBLISHER (PB) field (available for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications. The CA Lexicon is the copyrighted intellectual property of the American Chemical Society and is provided to assist you in searching databases on STN. Any dissemination, distribution, copying, or storing of this information, without the prior written consent of CAS, is strictly prohibited.

FILE COVERS 1907 - 28 Aug 2003 VOL 139 ISS 10
FILE LAST UPDATED: 28 Aug 2003 (20030828/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d his nofile

(FILE 'HOME' ENTERED AT 08:23:13 ON 04 SEP 2003)

FILE 'HCA' ENTERED AT 08:23:32 ON 04 SEP 2003

L1 14546 SEA ABB=ON PLU=ON NISHIDA ?/AU
L2 6415 SEA ABB=ON PLU=ON ENOMOTO ?/AU
L3 11872 SEA ABB=ON PLU=ON KOMATSU ?/AU
L4 1 SEA ABB=ON PLU=ON L1 AND L2 AND L3 AND INK? ← Applicants
SEL L4 RN

FILE 'REGISTRY' ENTERED AT 08:24:57 ON 04 SEP 2003

Tamra,

The author's or applicants record had 4 compounds indexed for claim 1. Alumina, potassium and sodium oxide, and ammonium oxide. Chem. abstracts indexed the compounds that went into making the alumina particle.

L5 4 SEA ABB=ON PLU=ON (12136-45-7/BI OR 12161-77-2/BI OR
1313-59-3/BI OR 1344-28-1/BI)
D SCAN
L6 2 SEA ABB=ON PLU=ON L5 AND (SODIUM# OR POTASSIUM#)
L7 2 SEA ABB=ON PLU=ON L5 NOT L6
L8 1 SEA ABB=ON PLU=ON L7 AND ALUMINUM#
L9 1 SEA ABB=ON PLU=ON L7 NOT L8
D SCAN
E LITHIUM OXIDE/CN

L10 1 SEA ABB=ON PLU=ON "LITHIUM OXIDE"/CN
E RUBIDIUM OXIDE/CN
L11 1 SEA ABB=ON PLU=ON "RUBIDIUM OXIDE"/CN
E CESIUM OXIDE/CN
L12 1 SEA ABB=ON PLU=ON "CESIUM OXIDE"/CN
E FRANCIUM OXIDE/CN
L13 1 SEA ABB=ON PLU=ON "FRANCIUM OXIDE"/CN
L14 6 SEA ABB=ON PLU=ON L6 OR L10 OR L11 OR L12 OR L13

FILE 'HCA' ENTERED AT 08:29:59 ON 04 SEP 2003

L15 213053 SEA ABB=ON PLU=ON L8 (alumina)

TAMRA, there are only 33 records (L16) in chemical abstracts where the ammonium oxide is indexed. Since I obtained so few hits, I also searched the process of claims L49-L84 to try to obtain relevant art.

L16 33 SEA ABB=ON PLU=ON L9
L17 32538 SEA ABB=ON PLU=ON L14 (Na and K oxide)

FILE 'LCA' ENTERED AT 08:30:20 ON 04 SEP 2003

L18 91 SEA ABB=ON PLU=ON (LITHIUM# OR LI OR SODIUM# OR NA OR
POTASSIUM# OR K OR RUBIDIUM# OR RB OR CESIUM# OR CS OR
FRANCIUM# OR FR) (A) OXIDE##
L19 45 SEA ABB=ON PLU=ON (AMMONIA# OR AMMONIUM# OR NH4 OR NH3) (2A) OX
IDE OR NH4 (W) O
L20 1181 SEA ABB=ON PLU=ON ALUMINA# OR (ALUMINUM OR AL) (A) OXIDE# OR
AL2O3

FILE 'HCA' ENTERED AT 08:33:26 ON 04 SEP 2003

L21 451238 SEA ABB=ON PLU=ON L15 OR L20 OR ALUMINA#
L22 9686 SEA ABB=ON PLU=ON L9 OR L19
L23 58038 SEA ABB=ON PLU=ON L18 OR L17
L24 200 SEA ABB=ON PLU=ON L21 AND L22 AND L23
L25 200 SEA ABB=ON PLU=ON L4 OR L24
D SCAN L4
L26 318969 SEA ABB=ON PLU=ON ALUMIN?/TI
L27 28 SEA ABB=ON PLU=ON L25 AND L26
L28 QUE ABB=ON PLU=ON PARTICL? OR MICROPARTICL? OR PARTICULAT?
OR DUST? OR GRIT? OR GRAIN# OR GRANUL? OR POWDER? OR SOOT? OR
SMUT? OR FINES# OR PRILL? OR FLAKE# OR PELLET? OR BB#
L29 33036 SEA ABB=ON PLU=ON L21 (2A) L28
L30 8 SEA ABB=ON PLU=ON L25 AND L29
D SCAN
L31 8 SEA ABB=ON PLU=ON L30 OR L4
D SCAN L4
L32 109333 SEA ABB=ON PLU=ON L21 (2A) USES
L33 160 SEA ABB=ON PLU=ON L22 (2A) USES
L34 13194 SEA ABB=ON PLU=ON L23 (2A) USE###
L35 4568 SEA ABB=ON PLU=ON L32 AND L34
L36 7 SEA ABB=ON PLU=ON L35 AND L33
D SCAN
L37 8 SEA ABB=ON PLU=ON L31 NOT L36
L38 30394 SEA ABB=ON PLU=ON INK? (A) JET? OR INKJET? OR INK? (A) PRINT?
L39 1 SEA ABB=ON PLU=ON L25 AND L38
L40 16 SEA ABB=ON PLU=ON L22 AND L38
L41 1 SEA ABB=ON PLU=ON L40 AND L32

L42 1 SEA ABB=ON PLU=ON L40 AND L21
L43 2 SEA ABB=ON PLU=ON L40 AND L23
L44 1 SEA ABB=ON PLU=ON L16 AND L38
L45 9 SEA ABB=ON PLU=ON L36 OR L39 OR L41 OR L42 OR L43 OR L44
L46 7 SEA ABB=ON PLU=ON L37 NOT L45
L47 10 SEA ABB=ON PLU=ON L16 AND (L21 OR L23)

FILE 'LCA' ENTERED AT 08:49:12 ON 04 SEP 2003
L48 11545 SEA ABB=ON PLU=ON (GEL## OR SOL## OR SOLGEL## OR HYDROGEL#
OR HYDRO#(W)GEL# OR SOL#(A)GEL#)

FILE 'REGISTRY' ENTERED AT 08:54:48 ON 04 SEP 2003
L49 2 SEA ABB=ON PLU=ON SODIUM ALUMINATE/CN
L50 1 SEA ABB=ON PLU=ON POTASSIUM ALUMINATE/CN
E LITHIUM ALUMINATE/CN
L51 1 SEA ABB=ON PLU=ON "LITHIUM ALUMINATE"/CN
E RUBIDIUM ALUMINATE/CN
L52 1 SEA ABB=ON PLU=ON "RUBIDIUM ALUMINATE"/CN
E CESIUM ALUMINATE/CN
L53 1 SEA ABB=ON PLU=ON "CESIUM ALUMINATE"/CN

FILE 'HCA' ENTERED AT 09:05:46 ON 04 SEP 2003
L54 7081 SEA ABB=ON PLU=ON L49 OR L50 OR L51 OR L52 OR L53
L55 10782 SEA ABB=ON PLU=ON (LITHIUM# OR LI OR SODIUM# OR NA OR
POTASSIUM# OR K OR RUBIDIUM# OR RB OR CESIUM# OR CS OR
FRANCIUM# OR FR) (2A)ALUMINATE#
L56 13193 SEA ABB=ON PLU=ON L54 OR L55
L57 183434 SEA ABB=ON PLU=ON NEUTRALI?
L58 42 SEA ABB=ON PLU=ON L56(2A)L57
L59 4015307 SEA ABB=ON PLU=ON (GEL## OR SOL## OR SOLGEL## OR HYDROGEL#
OR HYDRO#(W)GEL# OR SOL#(A)GEL#)
L60 30 SEA ABB=ON PLU=ON L58 AND L59
L61 QUE ABB=ON PLU=ON PRODUC? OR PROD# OR GENERAT? OR MANUF? OR
MFR# OR CREAT? OR FORM## OR FORMING# OR FORMAT? OR MAKE# OR
MADE# OR MAKIN# OR FABRICAT? OR SYNTHESI? OR PREPAR? OR PREP#
L62 29 SEA ABB=ON PLU=ON L61 AND L60
L63 21 SEA ABB=ON PLU=ON (L60 OR L62) AND (L21 OR L22 OR L23)
L64 20737 SEA ABB=ON PLU=ON L21(2A)L59
L65 6 SEA ABB=ON PLU=ON L60 AND L64
L66 21 SEA ABB=ON PLU=ON L63 OR L65
L67 15 SEA ABB=ON PLU=ON L66 NOT L65
D SCAN L65
D QUE STAT L55
L68 6 SEA ABB=ON PLU=ON L65 AND L55
L69 15 SEA ABB=ON PLU=ON L67 AND L55
L70 180010 SEA ABB=ON PLU=ON 49/SX,SC
L71 10 SEA ABB=ON PLU=ON L69 AND L70
L72 5 SEA ABB=ON PLU=ON L68 AND L70
D SCAN
L73 1005056 SEA ABB=ON PLU=ON COLOR? OR COLOUR? OR DYE? OR PIGMENT? OR
STAIN? OR PAINT? OR CHROMA# OR CHROMOGEN? OR CHROMOPHOR? OR
TINCT? OR TINT?
L74 2 SEA ABB=ON PLU=ON L71 AND L73
L75 0 SEA ABB=ON PLU=ON L72 AND L73
L76 10 SEA ABB=ON PLU=ON L71 OR L74
D SCAN L74
L77 QUE ABB=ON PLU=ON FILM? OR THINFILM? OR LAYER? OR OVERLAY?
OR OVERLAID? OR LAMIN? OR LAMEL? OR MULTILAYER? OR SHEET? OR
LEAF? OR FOIL? OR COAT? OR TOPCOAT? OR OVERCOAT? OR VENEER? OR
SHEATH? OR COVER? OR ENVELOP? OR ENCASE? OR ENWRAP? OR

OVERSPREAD?

L78 0 SEA ABB=ON PLU=ON L72 AND L77
 L79 3 SEA ABB=ON PLU=ON L76 AND L77
 L80 10 SEA ABB=ON PLU=ON L76 OR L79
 L81 2 SEA ABB=ON PLU=ON L62 AND L73
 L82 2 SEA ABB=ON PLU=ON L62 AND L73
 L83 3 SEA ABB=ON PLU=ON L62 AND L77
 L84 6 SEA ABB=ON PLU=ON L66 NOT (L80 OR L72)

FILE 'HCA' ENTERED AT 09:22:47 ON 04 SEP 2003

=> d L45 1-9 cbib abs hitind hitrn

L45 ANSWER 1 OF 9 HCA COPYRIGHT 2003 ACS on STN

137:326671 **Jet inks** with good ejection stability, storage stability, and water resistance, containers for them, and method and apparatus for jet printing using them. Onishi, Yasuharu; Endo, Hiroyuki; Ueki, Hiroyuki (Fuji Xerox Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002317132 A2 20021031, 15 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-119955 20010418.

AB The inks comprise colorants, org. solvents, surfactants, and additives, which increase pH of pure H2O at concn. of .gtoreq.1%. Optical densities of printed images from the inks of this invention (ODB) and inks without the additives (ODA) after immersing in H2O satisfy the relationship of ODB/ODA .gtoreq.1.05. Thus, an ink comprising Reactive Yellow 51, polyethylene glycol, glycerin, nonionic surfactants, H2O, and Na2CO3 was manufd.

IC ICM C09D011-00

ICS B41J002-01; B41M005-00

CC 42-12 (Coatings, Inks, and Related Products)

ST **jet ink** sodium carbonate storage stability; ejection stability **jet printing ink**; pH increase additive **jet ink** waterproofing

IT **Ink-jet** printers

Ink-jet printing

(**jet inks** contg. pH-increasing additives with good ejection stability, storage stability, and water resistance)

IT Water-resistant materials

(**jet-printing inks**; **jet inks**

contg. pH-increasing additives with good ejection stability, storage stability, and water resistance)

IT **Inks**

(**jet-printing**, anticlogging, storage-stable; **jet inks** contg. pH-increasing additives with good ejection stability, storage stability, and water resistance)

IT **Inks**

(**jet-printing**, water-resistant; **jet inks**

contg. pH-increasing additives with good ejection stability, storage stability, and water resistance)

IT Polyoxyalkylenes, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(solvent; **jet inks** contg. pH-increasing additives with good ejection stability, storage stability, and water resistance)

IT 62-54-4, Calcium acetate 62-76-0, Sodium oxalate 75-04-7, Ethylamine, uses 100-71-0, 2-Ethylpyridine 102-71-6, Triethanolamine, uses 108-89-4, 4-Methylpyridine 109-06-8, 2-Methylpyridine 109-89-7, Diethylamine, uses 110-86-1, Pyridine, uses 111-42-2, Diethanolamine, uses 121-44-8, Triethylamine, uses 126-96-5 127-08-2, Potassium acetate 127-09-3, Sodium acetate 127-95-7, Potassium hydrogen oxalate 141-43-5, Monoethanolamine, uses 142-72-3, Magnesium acetate 144-55-8,

Sodium bicarbonate, uses 298-14-6 471-34-1, Calcium carbonate, uses 497-19-8, Sodium carbonate, uses 506-87-6, Ammonium carbonate 536-78-7, 3-Ethylpyridine 546-89-4, Lithium acetate 546-93-0, Magnesium carbonate 547-66-0, Magnesium oxalate 553-91-3, Lithium oxalate 554-13-2, Lithium carbonate 563-72-4 584-08-7, Potassium carbonate 631-61-8, Ammonium acetate 694-56-4 1066-33-7, Ammonium hydrogencarbonate 1113-38-8, Ammonium oxalate 1186-49-8, Sodium hydrogen oxalate 1305-62-0, Calcium hydroxide, uses 1310-58-3, Potassium hydroxide, uses 1310-65-2, Lithium hydroxide 1310-73-2, Sodium hydroxide, uses 1330-43-4, Sodium tetraborate 1332-77-0, Potassium tetraborate 1336-21-6, Ammonium hydroxide 1628-89-3, 2-Methoxypyridine 4251-29-0, Potassium hydrogen acetate 5006-97-3, Lithium hydrogencarbonate 5972-72-5, Ammonium hydrogen oxalate 7558-79-4, Disodium hydrogen phosphate 7558-80-7, Sodium dihydrogen phosphate 7601-54-9, Trisodium phosphate 7722-76-1, Ammonium dihydrogen phosphate 7757-86-0, Magnesium hydrogen phosphate 7757-87-1 7758-11-4, Dipotassium hydrogen phosphate 7758-23-8, Calcium dihydrogen phosphate 7758-87-4, Tricalcium phosphate 7775-19-1, Sodium metaborate 7778-53-2, Tripotassium phosphate 7778-77-0, Potassium dihydrogen phosphate 10043-22-8, Potassium oxalate 10361-65-6, Ammonium phosphate 10377-52-3, Trilithium phosphate 11128-29-3, Potassium pentaborate 12007-58-8, **Ammonium boron oxide ((NH₄)₂B₄O₇)** 12007-60-2, Lithium tetraborate 12007-89-5, **Ammonium boron oxide ((NH₄)B₅O₈)** 12007-92-0, Sodium pentaborate 12008-41-2, **Boron sodium oxide (B₈Na₂O₁₃)** 12229-52-6, **Boron potassium oxide (B₆K₄O₁₁)** 12229-55-9, **Boron sodium oxide (B₆Na₄O₁₁)** 12429-66-2, **Boron magnesium oxide (B₆Mg₁₀O₁₀)** 13092-66-5, Magnesium dihydrogen phosphate 13453-69-5, Lithium metaborate 13453-80-0, Lithium dihydrogen phosphate 13703-82-7, Magnesium metaborate 13709-94-9, Potassium metaborate 15302-96-2, 1-Ethylpyridinium 25007-86-7 32446-62-1 34370-18-8, Lithium pentaborate 52458-41-0, Ammonium metaborate 58567-85-4, Lithium hydrogen oxalate 70984-28-0, Ammonium borate ((NH₄)₂B₈O₁₃) 77617-77-7 142261-32-3, Magnesium borate oxide (Mg₃(BO₂)₄O) 473711-69-2, Magnesium borate oxide (Mg₅(BO₂)₄O₃)
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)

(**jet inks** contg. pH-increasing additives with good ejection stability, storage stability, and water resistance)

IT 4399-55-7, Direct Blue 71 12225-30-8, Reactive Black 12 12225-49-9, C.I. Reactive Blue 32 12239-43-9, C.I. Reactive Red 14 61969-33-3, C.I. Reactive Yellow 51

RL: TEM (Technical or engineered material use); USES (Uses)

(**jet inks** contg. pH-increasing additives with good ejection stability, storage stability, and water resistance)

IT 56-81-5, Glycerin, uses 57-55-6, Propylene glycol, uses 107-21-1, Ethylene glycol, uses 111-46-6, Diethylene glycol, uses 112-34-5, Diethylene glycol monobutyl ether 143-22-6, Triethylene glycol monobutyl ether 25322-68-3, Polyethylene glycol

RL: TEM (Technical or engineered material use); USES (Uses)

(solvent; **jet inks** contg. pH-increasing additives with good ejection stability, storage stability, and water resistance)

L45 ANSWER 2 OF 9 HCA COPYRIGHT 2003 ACS on STN

134:210111 Novel **alumina** hydrate particles and their dispersion sol for liquid coating in forming **ink**-receiving layer and substrate having **ink**-receiving layer. **Nishida, Hiroyasu;**

Authors

Enomoto, Naoyuki; Komatsu, Michio (Catalysts & Chemicals Industries Co., Ltd., Japan). PCT Int. Appl. WO 2001016026 A1 20010308, 36 pp. DESIGNATED STATES: W: JP, KR, US; RW: DE, FR, GB. (Japanese).

CODEN: PIXXD2. APPLICATION: WO 2000-JP5334 20000809. PRIORITY: JP 1999-245496 19990831.

AB **Alumina** hydrate particles have a compn. represented by the formula: $xM_2O.y(NH_4)_2O.Al_2O_3.zH_2O$, wherein $2 \times 10^{-4} \leq x \leq 2.5 \times 10^{-4}$, $0.1 \times 10^{-4} \leq y \leq 2.0 \times 10^{-4}$, $0.6 \leq z \leq 2.5$, and M is an alkali metal, having an av. particle diam. of 0.02-0.2 μm and a total pore vol. 0.5-1.5 mL/g provided that the total pore vol. of the pores having a pore diam. of 15-30 nm is 0.3-1.0 mL/g. The **alumina** hydrate particles having a greater pore vol. together with a specific range of pore diam., and a high-concn. dispersion sol exhibits a low viscosity and high transparency. The **alumina** hydrate particles can be used for forming an **ink**-receiving layer which provides high stability of dyes, rapid absorption and a large absorption vol. for an **ink**, and no occurrence of bleeding.

IC ICM C01F007-00

ICS B41J002-01

CC 49-5 (Industrial Inorganic Chemicals)

Section cross-reference(s): 42

ST **alumina** hydrate particle dispersion sol coating; **ink** receiving **alumina** hydrate layer substrate

IT **Ink-jet** printers

Inks

(**alumina** hydrate particles and their dispersion sol for liq. coating in forming **ink**-receiving layer)

IT 1313-59-3, **Sodium oxide**, uses

1344-28-1, **Alumina**, uses 12136-45-7,

Potassium oxide, uses 12161-77-2,

Ammonium oxide (NH₄)₂O

RL: MOA (Modifier or additive use); USES (Uses)

(**alumina** hydrate particles and their dispersion sol for liq. coating in forming **ink**-receiving layer)

IT 1313-59-3, **Sodium oxide**, uses

1344-28-1, **Alumina**, uses 12136-45-7,

Potassium oxide, uses 12161-77-2,

Ammonium oxide (NH₄)₂O

RL: MOA (Modifier or additive use); USES (Uses)

(**alumina** hydrate particles and their dispersion sol for liq. coating in forming **ink**-receiving layer)

L45 ANSWER 3 OF 9 HCA COPYRIGHT 2003 ACS on STN

132:6667 Ammonia Synthesis over a Multipromoted Iron Catalyst: Extended Set of Activity Measurements, Microkinetic Model, and Hydrogen Inhibition. Sehested, Jens; Jacobsen, Claus J. H.; Tornqvist, Eric; Rokni, Said; Stoltze, Per (Haldor Topsoe Research Laboratories, Lyngby, DK-2800, Den.). Journal of Catalysis, 188(1), 83-89 (English) 1999. CODEN: JCTLA5. ISSN: 0021-9517. Publisher: Academic Press.

AB The ammonia synthesis activity of a multipromoted iron catalyst (KM1R, Haldor Topsoe A/S) is reported for a wide range of conditions. The H₂:N₂ ratio is varied by a factor of 10, the total pressures are between 1 and 100 bar, and temps. are in the range 320-440.degree.C. Data obtained here and literature data are compared. It is concluded that water poisoning is negligible in the present activity measurements and that hydrogen inhibition is important at the combined conditions of low temp., low ammonia partial pressure, and high total pressure. From a fit to the activity data a microkinetic model is obtained, which has H* and N* as surface species. The equil. const. of hydrogen adsorption obtained from single crystal studies, $2.16 \times 10^3 \text{ bar}^{-0.5} \exp(-48 \text{ kJ mol}^{-1} R^{-1} T^{-1})$, is used as input for the model. The obtained model parameters are the rate const. at zero coverage, $7.79 \text{ mmol g}^{-1} \text{ s}^{-1} \text{ bar}^{-1} \exp(-6.6 \text{ kJ mol}^{-1} R^{-1} T^{-1})$

and the equil. const. for the equil. between ammonia, hydrogen, and adsorbed nitrogen, $0.027 \text{ bar} \cdot 0.5 \exp(-27.1 \text{ kJ mol}^{-1} \text{ R}^{-1} \text{ T}^{-1})$. From these two parameters a rate of $1.43 \times 10^{12} \text{ s}^{-1} \exp(-162.4 \text{ kJ mol}^{-1} \text{ R}^{-1} \text{ T}^{-1})$ for nitrogen desorption is inferred. The performance of the model is compared to three microkinetic models found in the literature. The model gives a quant. account of the catalytic activity at all the measured degrees of conversions, pressures, and temps. and is consistent with surface science data. (c) 1999 Academic Press.

CC 67-3 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 49

IT 1305-78-8, Calcium **oxide**, **uses** 1344-28-1,
Alumina, **uses** 7439-89-6, Iron, **uses** 12136-45-7
, **Potassium oxide**, **uses**

RL: CAT (Catalyst use); USES (Uses)

(**ammonia** synthesis over multipromoted iron catalyst and
extended set of activity measurements, microkinetic model, and hydrogen
inhibition)

IT 1344-28-1, **Alumina**, **uses** 12136-45-7,
Potassium oxide, **uses**

RL: CAT (Catalyst use); USES (Uses)

(**ammonia** synthesis over multipromoted iron catalyst and
extended set of activity measurements, microkinetic model, and hydrogen
inhibition)

L45 ANSWER 4 OF 9 HCA COPYRIGHT 2003 ACS on STN

132:6635 Ammonia synthesis over multi-promoted iron catalysts obtained by high-energy ball-milling. Jacobsen, Claus J. H.; Jiang, Jianzhong; Morup, Steen; Clausen, Bjerne S.; Topsoe, Henrik (Haldor Topsoe Research Laboratories, Lyngby, DK-2800, Den.). Catalysis Letters, 61(3,4), 115-120 (English) 1999. CODEN: CALEER. ISSN: 1011-372X. Publisher: Baltzer Science Publishers.

AB The feasibility of producing ammonia synthesis catalysts from high-energy ball-milling of a simple mixt. of the constituent oxides has been investigated. The effect of ball-milling the fused oxidic precursor of the industrial KM1 ammonia synthesis catalyst has also been studied. The results show that high-energy ball-milling offers some interesting possibilities for prepg. novel catalytic materials. It is obsd. that ball-milling of the powder oxides mixt. leads to formation of solid solns. and the catalytic activity is significantly higher than that of the starting material. Furthermore, ball-milling of fused oxidic KM1 precursor is seen to give rise to more homogeneous promoter distribution and slightly higher activity. The quite small activity increase obsd. in this case probably reflects the fact that the fusion process has already resulted in a close to optimal promoter distribution. The choice of atm. during ball-milling is also seen to offer possibilities for regulating the phase compn.

CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 49

IT **Oxides** (inorganic), **uses**

RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process);
PROC (Process); USES (Uses)

(**ammonia** synthesis over multi-promoted iron catalysts
obtained by high-energy ball-milling)

IT 1305-78-8, Calcium **oxide**, **uses** 1309-37-1, Iron
oxide(Fe_2O_3), **uses** 1309-48-4, Magnesia, **uses**
1344-28-1, **Alumina**, **uses** 1345-25-1, Iron
oxide(FeO), **uses** 7439-89-6, Iron, **uses** 11113-52-3,
Calcium ferrite 12136-45-7, **Potassium oxide**,
uses 136363-78-5, Topsoe KM 1

RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process);

- PROC (Process); USES (Uses)
(**ammonia** synthesis over multi-promoted iron catalysts
obtained by high-energy ball-milling)
- IT 1344-28-1, Alumina, uses 12136-45-7,
Potassium oxide, uses
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process);
PROC (Process); USES (Uses)
(**ammonia** synthesis over multi-promoted iron catalysts
obtained by high-energy ball-milling)
- L45 ANSWER 5 OF 9 HCA COPYRIGHT 2003 ACS on STN
129:247215 Ammonia synthesis catalyst replacement. Tandon, K. M. (Shriram
Fertilisers and Chemicals, Kota, India). Fertiliser News, 43(6), 67-72
(English) 1998. CODEN: FENEAQ. ISSN: 0015-0266. Publisher: Fertiliser
Association of India.
- AB Ammonia synthesis catalyst is a reduced iron catalyst which in its reduced
form is extremely pyrophoric due to its well developed pore structure.
Replacement of this catalyst involves discharge of the catalyst under
nitrogen atm. The task was particularly difficult due to the limited
access owing to the small dimensions of the converter. This paper gives
details of the replacement carried out at SFC in Apr. 1998, the
difficulties faced and the solns. evolved.
- CC 49-8 (Industrial Inorganic Chemicals)
Section cross-reference(s): 19, 67
- IT 1305-78-8, Calcia, uses 1317-61-9, Iron oxide Fe3O4,
uses 1344-28-1, Alumina, uses
12136-45-7, Dipotassium oxide, uses
RL: CAT (Catalyst use); USES (Uses)
(**ammonia** synthesis catalyst replacement)
- IT 1344-28-1, Alumina, uses 12136-45-7,
Dipotassium oxide, uses
RL: CAT (Catalyst use); USES (Uses)
(**ammonia** synthesis catalyst replacement)
- L45 ANSWER 6 OF 9 HCA COPYRIGHT 2003 ACS on STN
125:17791 Removal of ammonia from waste gases by contacting with decomposition
catalysts. Iida, Kozo; Nojima, Shigeru; Tokuyama, Rie (Mitsubishi Heavy
Ind Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 08089758 A2 19960409 Heisei, 7
pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-229219 19940926.
- AB NH3 is removed from waste gases by contacting with decompn. catalyst
contg. .gtoreq.1 Pt-group metals on cryst. silicate supports having a
general formula of (1.+-.0.8)R2O.cntdot.[aM2O3.cntdot.bAl2O3].cntdot.cR'O.
cntdot.ySiO2 (R is H+ and/or alkali metal ions; M is .gtoreq.1 element of
Group VIII, rare earth metals, Ti, Pd, Cr, Nb, Sn, Ga; R' is .gtoreq.1
alk. earth metals; a .gtoreq.0, b .gtoreq.0, c .gtoreq.0, but a + b =1,
y/c >12, y >12) and having x-ray diffraction pattern.
- IC ICM B01D053-86
ICS B01D053-58; B01J029-04; B01J029-87; B01J029-88; B01J029-89
- CC 59-2 (Air Pollution and Industrial Hygiene)
- IT 1314-23-4, Zirconium oxide, uses 1344-28-1,
Aluminum oxide, uses 7440-06-4, Platinum,
uses 13463-67-7, Titanium oxide, uses
RL: CAT (Catalyst use); USES (Uses)
(**ammonia** decompn. catalyst for waste gases)
- IT 1304-28-5, Barium oxide, uses 1305-78-8, Calcium oxide, uses
1308-04-9, Cobalt sesquioxide 1308-38-9, Chromium sesquioxide, uses
1309-37-1, Iron sesquioxide, uses 1309-48-4, Magnesium oxide, uses
1309-64-4, Antimony sesquioxide, uses 1312-81-8, Lanthanum sesquioxide
1313-59-3, Sodium oxide, uses
1314-11-0, Strontium oxide, uses 1314-34-7, Vanadium sesquioxide

- 1345-13-7, Cerium sesquioxide 12024-21-4, Gallium oxide (Ga₂O₃)
12036-35-0, Rhodium sesquioxide 12059-63-1, Niobium sesquioxide
12060-06-9, Ruthenium oxide (Ru₂O₃)
RL: CAT (Catalyst use); USES (Uses)
(silicate component; ammonia decompn. catalyst for waste gases)
- IT 1344-28-1, Aluminum oxide, uses
RL: CAT (Catalyst use); USES (Uses)
(ammonia decompn. catalyst for waste gases)
- IT 1313-59-3, Sodium oxide, uses
RL: CAT (Catalyst use); USES (Uses)
(silicate component; ammonia decompn. catalyst for waste gases)
- L45 ANSWER 7 OF 9 HCA COPYRIGHT 2003 ACS on STN
- 119:216302 Solid proton conductors as room-temperature gas sensors. Kleperis, J.; Vaivars, G.; Bajars, G.; Kranevskis, A.; Lasis, A.; Vitins, G. (Institute of Solid State Physics of University of Latvia, 8 Kengaraga Street, Riga-63, LV-1063, Latvia). Sensors and Actuators, B: Chemical, 13(1-3), 269-71 (English) 1993. CODEN: SABCEB. ISSN: 0925-4005.
- AB NH₃-exchanged ceramic samples of beta alumina were obtained from plasma-dispersed powders. The ionic cond. is slightly affected by ion exchange, but the surface cond. for the ammonia-exchanged sample drastically changes in the presence of the H₂O and NH₃ vapors. The NH₃-doped xerogel of antimonite acid hydrate as a thick film was tested as a potentiometric NH₃ sensor.
- CC 79-2 (Inorganic Analytical Chemistry)
Section cross-reference(s): 57
- IT 1313-59-3, Sodium oxide, uses
1344-28-1, Alumina, uses 12057-24-8,
Lithium oxide, uses
RL: USES (Uses)
(ammonia-exchanged ceramic samples prepd. from, as solid proton conductors in room-temp. gas sensors)
- IT 1313-59-3, Sodium oxide, uses
1344-28-1, Alumina, uses 12057-24-8,
Lithium oxide, uses
RL: USES (Uses)
(ammonia-exchanged ceramic samples prepd. from, as solid proton conductors in room-temp. gas sensors)
- L45 ANSWER 8 OF 9 HCA COPYRIGHT 2003 ACS on STN
- 117:220891 A thermal stability study of the magnetite-based ammonia synthesis catalyst. Aleksic, Bojana D.; Radic, Nenad D.; Mitov, I.; Radakovic, Aleksandra A.; Mitrovski, Svetlana M. (Inst. Catal. Chem. Eng., IChTM, Belgrade, YU-11000, Yugoslavia). Journal of the Serbian Chemical Society, 57(7), 433-42 (English) 1992. CODEN: JSCSEN. ISSN: 0352-5139.
- AB The thermal stability of the ammonia synthesis catalyst prepd. by melting natural magnetite with promoters was estd. on the basis of the changes obsd. by measuring its activity, total sp. surface area, the sp. surface area of the iron and the alk. promoters, in addn. to the phase compn. before and after thermal treatment of the catalyst at temps. of 600-750.degree. for 5-20 h. The appropriate exptl. conditions for the detn. of the thermal stability of the synthesized catalyst were defined. Changes in the textural and structural properties of the catalyst obsd. in the course of thermal treatment were not sufficiently pronounced to be taken as criteria for the assessment of the thermal stability of melted ammonia synthesis catalysts. The ratio of the ammonia synthesis reaction rate consts. detd. after and before thermal treatment of the samples represents the thermal stability factor. This ratio showed that the thermal stability of the synthesized catalyst was considerably better than the generally used com. catalyst.

- CC 67-2 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 49
- IT 1309-38-2P, Magnetite, **uses**
RL: CAT (Catalyst use); PREP (Preparation); USES (Uses)
(catalysts, **oxide**-promoted, for **ammonia** synthesis,
effect of thermal treatment temp. on structure and activity of)
- IT 1305-78-8, Calcium oxide, **uses** 1309-48-4, Magnesia, **uses**
1344-28-1, Alumina, uses 12136-45-7,
Potassium oxide, uses
RL: USES (Uses)
(magnetite catalyst promoted by, thermal stability in relation to)
- IT **1344-28-1, Alumina, uses 12136-45-7,**
Potassium oxide, uses
RL: USES (Uses)
(magnetite catalyst promoted by, thermal stability in relation to)
- L45 ANSWER 9 OF 9 HCA COPYRIGHT 2003 ACS on STN
- 116:68440 Process for producing the precursor of a precipitated catalyst for ammonia synthesis. Montino, Franco; Balducci, Luigi; Ferrero, Francesco; Pernicone, Nicola (Ministero dell' Universita'e della Ricerca Scientifica e Tecnologica, Italy). Eur. Pat. Appl. EP 459424 A1 19911204, 12 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, NL, SE. (English). CODEN: EPXXDW. APPLICATION: EP 1991-108740 19910528. PRIORITY: IT 1990-20455 19900529.
- AB This process produces the precursor of a pptd. catalyst for NH3 synthesis, based on Fe, Al, Co and K oxides, and comprises (a) prepg. an aq. soln. of water-sol. compds. of Fe, Al, and Co, Fe being present as a water-sol. ferrous salt of an org. acid, and causing, by addn. of an alk. pptg. soln., the co-pptn. of the corresponding Fe, Al, and Co hydroxides, which still contain the Fe in ferrous form; (b) oxidizing the hydroxide suspension prepd. according to (a) until the ratio of divalent Fe to trivalent Fe ranges from 0.20-0.50; and (c) conducting an alk. doping operation with a K compd. and heating the resulting mixt. in an inert atm. to .gtoreq.850.degree..
- IC ICM B01J023-78
ICS B01J035-10; C01C001-04
- CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 49
- IT 1332-37-2, Iron **oxide, uses 1344-28-1,**
Aluminum oxide, uses 11104-61-3, Cobalt
oxide 12136-45-7, Potassium oxide,
uses
RL: USES (Uses)
(**ammonia** synthesis catalyst contg.)
- IT **1344-28-1, Aluminum oxide, uses**
12136-45-7, Potassium oxide, uses
RL: USES (Uses)
(**ammonia** synthesis catalyst contg.)
- => d L46 1-7 cbib abs hitind hitrn
- L46 ANSWER 1 OF 7 HCA COPYRIGHT 2003 ACS on STN
- 115:58163 Preparation of cobalt-molybdenum catalyst for carbon monoxide conversion. Chen, Jinsong; Hua, Nanping; et al. (Hubei Chemical Institute, Peop. Rep. China). Faming Zhuanli Shenqing Gongkai Shuomingshu CN 1042482 A 19900530, 5 pp. (Chinese). CODEN: CNXXEV. APPLICATION: CN 1989-108457 19891107.
- AB A S-resistant Co-Mo catalyst for CO conversion is prepd. by soaking spherical carrier **particles**, such as **Al2O3**

particles, in an NH_4OH soln. contg. NH_4 molybdate, a sol. Co salt selected from the group consisting of $\text{Co}(\text{NO}_3)_2$, CoCl_2 , $\text{Co}(\text{AcO})_2$, and $\text{Co}(\text{HCO}_2)_2$, and an alkali metal (Na, K, or Cs) nitrate, carbonate, or acetate and drying at room temp. or under the sun. The catalyst thus prepd. comprises CoO 3-7, MoO_3 15-22, and an alkali metal oxide 5-20% and the prepn. method does not require high-temp. baking and sintering, thus avoiding the formation of undesirable Co_2O_3 .

IC ICM B01J023-78

CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)

IT 1313-59-3, **Sodium oxide**, uses and miscellaneous 12136-45-7, **Potassium oxide**, uses and miscellaneous 20281-00-9, **Cesium oxide**

RL: USES (Uses)

(cobalt oxide-molybdenum oxide carbon monoxide conversion catalysts contg., for synthesis of ammonia)

IT 630-08-0, Carbon monoxide, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(conversion of, in synthesis of **ammonia**, cobalt **oxide** -molybdenum oxide catalyst contg. alkali metal oxides for)

IT 1313-59-3, **Sodium oxide**, uses and miscellaneous 12136-45-7, **Potassium oxide**, uses and miscellaneous 20281-00-9, **Cesium oxide**

RL: USES (Uses)

(cobalt oxide-molybdenum oxide carbon monoxide conversion catalysts contg., for synthesis of ammonia)

L46 ANSWER 2 OF 7 HCA COPYRIGHT 2003 ACS on STN

97:223905 Metal oxide catalyst composition. Topham, Susan Ann (Imperial Chemical Industries PLC, UK). Eur. Pat. Appl. EP 60622 A1 19820922, 12 pp. DESIGNATED STATES: R: BE, DE, FR, GB, IT, NL, SE. (English). CODEN: EPXXDW. APPLICATION: EP 1982-300749 19820215. PRIORITY: GB 1981-8409 19810318.

AB A metal oxide catalyst compn. is in the form of particles having at least 1 face formed by solidification of a melt in contact with a surface and preferably having at least 1 channelled surface whereby the pressure drop through a bed of such particles is limited. The particles are made preferably by casting the melt and fracturing the resulting layer. Such a compn. comprising Fe oxide is a precursor for an NH_3 -synthesis catalyst. E.g., a mixt. of finely **powd.** compn. of Al_2O_3 2.4, CaO 1.4, K_2O 1.0, SiO_2 0.4, and Fe_3O_4 94.8% by wt. was melted at 1600.degree. and the melt cast in corrugated trays. The corrugations were 2mm deep and 7mm wide, sepd. by 1mm. The solidified layer was crushed and sieved, and the particles were dild. by SiO_2 chips and used as catalyst in the reaction of 3:1 $\text{H}_2:\text{N}_2$ at 475.degree.. The catalyst activity is 6-7% higher than that of com. catalysts.

IC B01J037-00; B01J023-74; C01C001-04

CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 48

ST metal **oxide** catalyst **ammonia** synthesis; iron **oxide ammonia** synthesis catalyst

IT Particle size

(of **oxide** catalysts, for **ammonia** synthesis, for low pressure drop)

IT Catalysts and Catalysis

(**oxide**, granulated, for **ammonia** synthesis, with low pressure drop)

IT 1305-78-8, uses and miscellaneous 12136-45-7, uses and miscellaneous

RL: CAT (Catalyst use); USES (Uses)
(catalysts from iron **oxide** contg., for **ammonia**
synthesis)

IT 12136-45-7, uses and miscellaneous

RL: CAT (Catalyst use); USES (Uses)
(catalysts from iron **oxide** contg., for **ammonia**
synthesis)

L46 ANSWER 3 OF 7 HCA COPYRIGHT 2003 ACS on STN

96:39622 Effect of the starting **aluminum oxide** and of the
method of preparation on the characteristics of lithium-stabilized
.beta.-**aluminum oxide** ceramics. Kvachkov, R.;
Yanakiev, A.; Puliev, Kh.; Balkanov, I.; Yankulov, P. D.; Budevski, E.
(Cent. Lab. Electrochem. Power Sour., Sofia, 1040, Belg.). Journal of
Materials Science, 16(10), 2710-16 (English) 1981. CODEN: JMTSAS. ISSN:
0022-2461.

AB The influence of the morphol. and particle size of various types of
Al2O3 materials on the synthesis and characteristics of
Li-stabilized .beta.-**alumina** ceramics were investigated. The
use of highly dispersed oxides results in higher densities in the fired
ceramic bodies owing to their higher reactivity. In the case of
oxides obtained from **NH4** alum, the degree of dispersion
and the reactivity may be increased by raising the amt. of .gamma.-
Al2O3 up to a certain limit. **Al2O3** prep'd. from
Al2(OH)5NO3 by slurry spray-drying also gave satisfactory results despite
its lower degree of dispersion. This was connected with the morphol. of
the particles. In the case of synthesized materials contg. an
insufficient amt. of .beta.-**alumina**-**NaAlO2** eutectic, high
densities were also achieved by applying a 2-step firing schedule at
temps. above the m.p. of the eutectic.

CC 57-2 (Ceramics)

ST beta **alumina** synthesis property; **lithium oxide**
beta **alumina** ceramic; **particle size** beta
alumina synthesis

IT **Particle size**

(of **alumina**, synthesis and properties of lithium-modified
.beta.-**alumina** ceramics in relation to)

IT Batteries, secondary

(sodium-sulfur, lithium-modified .beta.-**alumina** electrolytes
for, synthesis and properties of, **alumina particle**
size and morphol. in relation to)

IT Ceramic materials and wares

(.beta.-**alumina**, lithium-modified, synthesis and properties
of, **alumina particle** size and morphol. in relation
to)

IT 11138-49-1P

RL: PREP (Preparation); USES (Uses)
(ceramics, lithium-modified, synthesis and properties of,
alumina particle size and morphol. in relation to)

IT 1344-28-1P, properties

RL: PRP (Properties); PREP (Preparation)
(morphol. and particle size and source of, synthesis and properties of
lithium-modified .beta.-**alumina** ceramics in relation to)

IT 1344-28-1P, properties

RL: PRP (Properties); PREP (Preparation)
(morphol. and particle size and source of, synthesis and properties of
lithium-modified .beta.-**alumina** ceramics in relation to)

L46 ANSWER 4 OF 7 HCA COPYRIGHT 2003 ACS on STN

84:170182 Study of the catalytic properties of supported iron catalysts in an

ammonia synthesis reaction. Komarov, V. S.; Rabina, P. D.; Efros, M. D.; Dmitrenko, L. M.; Ivanova, R. F.; Kuznetsov, L. D.; Repina, N. S.; Chopik, S. I.; Anisimova, M. I. (Inst. Obshch. Neorg. Khim., Minsk, USSR). Vestsi Akademii Navuk BSSR, Seryya Khimichnykh Navuk (1), 10-13 (Russian) 1976. CODEN: VBSKAK. ISSN: 0002-3590.

AB The catalytic activity of NH_3 -synthesis catalysts, prepd. by a treatment of oxide supports by Fe nitrate solns., was studied as a function of support properties. Fine powder Al_2O_3 pretreated at 1000.degree., Al_2O_3 prepd. by baking Al hydroxide at 500.degree., and $\text{ZrO}_2 \cdot 3\text{CaO} \cdot \text{Al}_2\text{O}_3$ were used as supports (I, II, and III, resp.). Catalytic activity decreased with support in the order $\text{III} > \text{I} > \text{II}$. This is also the order of decreasing acidity. A treatment of the catalysts with K_2O promoted catalytic activity, esp. that of III -supported catalyst.

CC 67-2 (Catalysis and Reaction Kinetics)

ST oxide support ammonia catalytic synthesis; support effect ammonia catalyst activity; iron ammonia catalyst support

IT 12136-45-7

RL: RCT (Reactant); RACT (Reactant or reagent)
(promoter, for supported iron catalysts for ammonia synthesis)

IT 12136-45-7

RL: RCT (Reactant); RACT (Reactant or reagent)
(promoter, for supported iron catalysts for ammonia synthesis)

L46 ANSWER 5 OF 7 HCA COPYRIGHT 2003 ACS on STN

77:38548 Refractory binder and compositions. Dreyling, Alfred P.; Dreyling, Lewis J. (Quibley Company, Inc.). Brit. GB 1269857 19720406, 6 pp. (English). CODEN: BRXXAA. APPLICATION: GB 1969-53064 19691029.

AB Binders for granular refractories, such as Al_2O_3 , MgO , ZrO_2 , zircon, mullite, and Cr ore, provided 25-200 min setting times of the moist refractory mixts. without heating to a hard strong mass with little shrinkage. The binders consisted of an aq. mixt. of Na silicate with 0.5-5 times its wt. of $\text{NH}_4\text{B}_5\text{O}_8 \cdot 4\text{H}_2\text{O}$. The refractory contg. the quick-setting binder (2-15 wt. %) was used as patching materials on a furnace lining. A preferred silicate was DuPont No. 6 having a SiO_2 Na_2O ratio of 2, but ratios of 0.2-5 are suitable. The wet mixts. were allowed to set; the setting time increased from .apprx.2 min with a ratio of 5 to .apprx.17 with a ratio of 0.2, whereas with no borate, or no silicate, there was no set in 70 min. When MgO trowelling mixes contg. 10 wt. % H_2O were bonded with these mixts. the setting time varied from 25 min when the silicate-borate ratio was 0.4, to 72 min when it was 1.25. When an Al_2O_3 grain was mixed with silicate 1.5, borate 2.5, and H_2O 13 wt. % and molded as a 50 lb block, the setting time was 3.5 hr compared to 12-14 hr when the binder was 4% silicate or 4% borate; and when fired at 2950.degree.F the shrinkage was <1%.

IC C04B

CC 57-5 (Ceramics)

IT Refractories

(aluminum oxide, sodium silicate-ammonium pentaborate binders for)

L46 ANSWER 6 OF 7 HCA COPYRIGHT 2003 ACS on STN

71:129207 Kinetic study and electric conductivity of some industrial catalysts used in the synthesis of ammonia. Nicolescu, Ioan V.; Spinzi, M.; Spinzi, Antoaneta Revistade Chimie (Bucharest, Romania), 20(6), 337-43 (Romanian) 1969. CODEN: RCBUAU. ISSN: 0034-7752.

AB An exptl. study was carried out on the elec. cond. of the industrial catalyst BASF-K3-10 and on the synthetic catalyst obtained by pelletizing a mixt. of Fe_2O_3 , FeO , Fe_3O_4 + (Al_2O_3 - K_2O) powders, followed by sintering at 1300.degree.. An attempt was also made to

establish a connection between the kinetics of the chem. process and the apparent activation energy of the elec. cond. of the catalyst in the case of H and N adsorption.

CC 67 (Catalysis and Reaction Kinetics)

IT Catalysts

(iron **oxide**, for **ammonia** manuf., elec. cond. of)

IT Activation energy of electric conduction

Electric conductivity

(of iron **oxide** catalysts, for **ammonia** manuf.)

IT 1309-37-1, properties 1317-61-9 12136-45-7

RL: PRP (Properties)

(elec. cond. of)

IT 12136-45-7

RL: PRP (Properties)

(elec. cond. of)

L46 ANSWER 7 OF 7 HCA COPYRIGHT 2003 ACS on STN

46:12707 Original Reference No. 46:2245g-h Catalysts for synthesis of ammonia II. Examination of the catalysts in current use and a procedure of preparing a good catalyst. Shima, Goro; Uchida, Hiroshi (Govt. Chem. Ind. Research Inst., Tokyo). Repts. Govt. Chem. Ind. Research Inst. Tokyo, 45, 369-77 (English) 1950.

AB In testing 4 Japanese and 2 German com. Fe₂O₃-Al₂O₃ catalysts in synthesizing NH₃ from N and H (1:3) gases at 350-550.degree./50 kg./sq. cm. and at 700.degree./atm. the catalytic activity was lowered by impurities and imperfect diffusion of the promoters. A catalyst prepd. from **powd.** Fe₂O₃ and Al₂O₃ by thoroughly mixing, sintering into porous rods in a stream of H, and after adding aq. KNO₃, burning in O was highly catalytic and thermostable.

CC 18 (Acids, Alkalies, Salts, and Other Heavy Chemicals)

IT Lime

(effect on catalyst from Al₂O₃ and Fe₂O₃ for NH₃ synthesis)

IT FeO, Fe₂O₃

FeO, Fe₂O₃

(catalysts from Al₂O₃ and, in NH₃ synthesis)

IT Potassium oxides, K₂O₇

(effect on catalysts from Al₂O₃ and Fe₂O₃ for NH₃ synthesis)

IT 1344-28-1, Alumina

(catalysts from Fe **oxides** and, in NH₃ synthesis)

IT 1309-48-4, Magnesia

(effect on catalyst from Al₂O₃ and Fe₂O₃ for NH₃ synthesis)

IT 1344-28-1, Alumina

(catalysts from Fe **oxides** and, in NH₃ synthesis)

=> d L80 1-10 cbib abs hitind hitrn

L80 ANSWER 1 OF 10 HCA COPYRIGHT 2003 ACS on STN

139:119325 Preparation of pseudo-boehmite and .gamma.-Al₂O₃

support by neutralization of NaAlO₂ solution with CO₂. Yang, Qinghe; Liu, Bin; Li, Dadong; Shi, Yahua; Nie, Hong; Kang, Xiaohong (Research Institute of Petroleum Processing, SINOPEC, Beijing, 100083, Peop. Rep. China). China Petroleum Processing and Petrochemical Technology (1), 47-51 (English) 2003. CODEN: CPPTFS. ISSN: 1008-6234. Publisher: China Petroleum Processing and Petrochemical Technology Press.

AB Pseudo-boehmite (PB) and .gamma.-Al₂O₃ support are **prepd**

. by neutralization of NaAlO₂ **soln.** with CO₂ (mixed gases) on bench scale. PB, typically loosely packed, fibrous particle/aggregate, is obtained by adjusting concn. and flow rate of CO₂ and concn. of NaAlO₂ **soln.** at a pH level lower than that commonly assumed during

- neutralization. After calcination at different temps., .gamma.-
Al2O3 supports with different pore vol. and different pore size
are **prepd.** at different conditions.
- CC 49-4 (Industrial Inorganic Chemicals)
- ST pseudoboehmite **alumina neutralization sodium**
aluminate carbon dioxide
- IT Catalyst supports
Neutralization
(**prepn.** of pseudo-boehmite and **alumina** support by
neutralization of sodium aluminate
soln. with carbon dioxide)
- IT 24623-77-6P, Aluminum hydroxide **oxide** (**Al(OH)O**)
RL: PNU (Preparation, unclassified); PREP (Preparation)
(boehmite-type, pseudo; **prepn.** of pseudo-boehmite and
alumina support by **neutralization of sodium**
aluminate soln. with carbon dioxide)
- IT 124-38-9, Carbon dioxide, processes 1302-42-7, **Sodium**
aluminate (**NaAlO2**)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical
process); PROC (Process)
(**prepn.** of pseudo-boehmite and **alumina** support by
neutralization of sodium aluminate
soln. with carbon dioxide)
- IT 1344-28-1P, **Alumina, preparation**
RL: PNU (Preparation, unclassified); PREP (Preparation)
(**prepn.** of pseudo-boehmite and **alumina** support by
neutralization of sodium aluminate
soln. with carbon dioxide)
- IT 1344-28-1P, **Alumina, preparation**
RL: PNU (Preparation, unclassified); PREP (Preparation)
(**prepn.** of pseudo-boehmite and **alumina** support by
neutralization of sodium aluminate
soln. with carbon dioxide)
- L80 ANSWER 2 OF 10 HCA COPYRIGHT 2003 ACS on STN
- 130:141400 Studies of aging during neutralization of **NaAlO2** solution by **CO2**
for **preparation** of pseudo-boehmite. Yang, Qinghe; Li, Dadong;
Zhuang, Fucheng; Shi, Yahua; Kang, Xiaohong (Res. Inst. Petroleum
Processing, Beijing, 100083, Peop. Rep. China). Shiyou Xuebao, Shiyou
Jiagong, 14(4), 24-29 (Chinese) 1998. CODEN: SXSHEY. ISSN: 1001-8719.
Publisher: Zhongguo Shihua Chubanshe.
- AB During neutralization of **NaAlO2 soln.** by **CO2** for **prepn**
. of pseudo-boehmite, the effect of aging variables, including medium, pH,
temp., time, pressure etc. upon the properties of pseudo-boehmite was
studied. The possibility of pseudo-boehmite transforming into .beta.1-
Al2O3.3H2O and .beta.1-**Al2O3.3H2O** turning into
pseudo-boehmite during aging was discussed.
- CC 51-6 (Fossil Fuels, Derivatives, and Related Products)
Section cross-reference(s): 49, 67
- ST **sodium aluminate neutralization** carbon
dioxide pseudoboehmite; **alumina** petroleum refining catalyst
- IT Petroleum refining catalysts
(aging during neutralization of **NaAlO2 soln.** by **CO2** for
prepn. of pseudo-boehmite)
- IT 1344-28-1P, **Alumina, uses**
RL: CAT (Catalyst use); PNU (Preparation, unclassified); PREP
(Preparation); USES (Uses)
(aging during neutralization of **NaAlO2 soln.** by **CO2** for
prepn. of pseudo-boehmite)
- IT 1302-42-7P 12428-54-5P, Boehmite (**Al2O3.H2O**)

- 21645-51-2P, Aluminum hydroxide ($\text{Al}(\text{OH})_3$), uses
RL: CAT (Catalyst use); PNU (Preparation, unclassified); PREP
(Preparation); USES (Uses)
(aging during **neutralization of sodium
aluminate soln.** by CO_2 for **prepn.** of
pseudo-boehmite)
- IT 1344-28-1P, Alumina, uses
RL: CAT (Catalyst use); PNU (Preparation, unclassified); PREP
(Preparation); USES (Uses)
(aging during neutralization of NaAlO_2 **soln.** by CO_2 for
prepn. of pseudo-boehmite)
- IT 1302-42-7P
RL: CAT (Catalyst use); PNU (Preparation, unclassified); PREP
(Preparation); USES (Uses)
(aging during **neutralization of sodium
aluminate soln.** by CO_2 for **prepn.** of
pseudo-boehmite)
- L80 ANSWER 3 OF 10 HCA COPYRIGHT 2003 ACS on STN
124:121325 Weathering-resistant titanium dioxide **pigments**. Ishida,
Kuniteru; Fukumoto, Hiroshi; Yamamoto, Tsutomu (Sakai Chemical Industry
Co, Japan). Jpn. Kokai Tokkyo Koho JP 07292277 A2 19951107 Heisei, 4 pp.
(Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-126697 19940428.
- AB The title **pigments**, useful for **coatings**, plastics,
etc., contain 1-6% (as SiO_2) Si oxides, 0.1-3% (as SnO_2) Sn oxides, 0.1-5%
(as ZrO_2) Zr oxides, and 1-5% (as Al_2O_3) on the surface of
81-97.8% substrates comprising rutile-type TiO_2 contg. 0.1-2% (as
 Al_2O_3) Al compds. or 0.1-5% (as Al_2O_3 and ZrO_2) Al
compds. and Zr compds. Thus, meta-titanic acid was treated with aq.
 $\text{Al}_2(\text{SO}_4)_3$ **soln.**, roasted, treated with Na silicate **soln.**
., H_2SO_4 , aq. NaOH **soln.**, SnCl_2 **soln.**, $\text{Zr}(\text{SO}_4)_2$
soln., and Na aluminate **soln.**, then
neutralized to give weathering-resistant **pigment** compn.
- IC ICM C09C001-36
CC 49-3 (Industrial Inorganic Chemicals)
Section cross-reference(s): 37, 42
- ST titania **alumina pigment** weathering resistance; silica
zirconia stabilizer titania **pigment**; tin oxide stabilizer
titania **pigment**; plastic **coating** titania
pigment stabilizer
- IT **Coating** materials
Heat stabilizers
Light stabilizers
(weathering-resistant titania **pigments** coated with
metal oxides for plastics and **coatings**)
- IT Plastics
RL: MSC (Miscellaneous)
(weathering-resistant titania **pigments** coated with
metal oxides for plastics and **coatings**)
- IT 13463-67-7P, Titania, **preparation**
RL: PNU (Preparation, unclassified); PRP (Properties); TEM (Technical or
engineered material use); PREP (Preparation); USES (Uses)
(rutile-type; weathering-resistant titania **pigments**
coated with metal oxides for plastics and **coatings**)
- IT 1314-23-4, Zirconium oxide (ZrO_2), uses 1344-28-1,
Alumina, uses 7631-86-9, Silica, uses 18282-10-5, Tin oxide
(SnO_2)
RL: MOA (Modifier or additive use); USES (Uses)
(weathering-resistant titania **pigments** coated with
metal oxides for plastics and **coatings**)

- IT 1344-28-1, Alumina, uses
RL: MOA (Modifier or additive use); USES (Uses)
(weathering-resistant titania **pigments coated** with
metal oxides for plastics and **coatings**)
- L80 ANSWER 4 OF 10 HCA COPYRIGHT 2003 ACS on STN
124:121324 Light-resistant titanium dioxide **pigments**. Ishida,
Kuniteru; Fukumoto, Hiroshi; Oohira, Hiroya (Sakai Chemical Industry Co,
Japan). Jpn. Kokai Tokkyo Koho JP 07292276 A2 19951107 Heisei, 3 pp.
(Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-126696 19940428.
- AB The title **pigments**, useful for plastics, etc., comprise 90-98.8%
rutile-type TiO₂ as a substrate, where 0.1-5% (as ZrO₂) Zr oxides, 0.1-3%
(as Sb₂O₅) Sb oxide hydrates, 1-5% (as Al₂O₃) Al
oxide hydrates, and 0.1-2% (as F) F- exist on the surface of the
substrate. Thus, meta-titanic acid was treated with aq. Zr carbonate
soln., roasted at 900.degree., treated with aq. SbCl₅ **soln**
., aq. NH₄F **soln.**, and Na aluminate, then
neutralized to give light-resistant **pigment** compn.
- IC ICM C09C001-36
CC 49-3 (Industrial Inorganic Chemicals)
Section cross-reference(s): 37
- ST alumina fluoride stabilizer titania **pigment**; antimony
oxide stabilizer titania **pigment**; light stabilizer titania
pigment zirconia
- IT Light stabilizers
(light-resistant titania **pigment coated** with metal
oxides and fluorides for plastics)
- IT Fluorides, uses
RL: MOA (Modifier or additive use); USES (Uses)
(light-resistant titania **pigment coated** with metal
oxides and fluorides for plastics)
- IT Plastics
RL: MSC (Miscellaneous)
(light-resistant titania **pigment coated** with metal
oxides and fluorides for plastics)
- IT 1309-64-4, Antimony trioxide, uses 1314-23-4, Zirconium oxide, uses
1344-28-1, Aluminum oxide, uses 16984-48-8,
Fluoride, uses
RL: MOA (Modifier or additive use); USES (Uses)
(light-resistant titania **pigment coated** with metal
oxides and fluorides for plastics)
- IT 13463-67-7P, Titania, **preparation**
RL: PNU (Preparation, unclassified); PRP (Properties); TEM (Technical or
engineered material use); PREP (Preparation); USES (Uses)
(rutile-type; light-resistant titania **pigment coated**
with metal oxides and fluorides for plastics)
- IT 1344-28-1, Aluminum oxide, uses
RL: MOA (Modifier or additive use); USES (Uses)
(light-resistant titania **pigment coated** with metal
oxides and fluorides for plastics)
- L80 ANSWER 5 OF 10 HCA COPYRIGHT 2003 ACS on STN
108:43396 **Preparation** of sodium aluminate blocks
for acidic wastewater treatment. Hatton, William (Laporte Industries
Ltd., UK). Brit. UK Pat. Appl. GB 2188312 A1 19870930, 4 pp. (English).
CODEN: BAXXDU. APPLICATION: GB 1987-5470 19870309. PRIORITY: GB
1986-7563 19860326.
- AB Industrial acidic wastewater is **neutralized** with Na
aluminate blocks **prepd.** by concn., molding, seeding, and
crystn. An aq. Na aluminate **soln.** contg.

10-25% Na₂O and 15-30% **Al₂O₃** is concd. close to the spontaneous crystn. point until reaching 130-135.degree. b.p., and the concd. **soln.** is molded and seeded with **Na aluminate** particles (diam. .gtoreq.1 mm, .gtoreq.75%) contg. .gtoreq.40% Na₂O and/or .gtoreq.50% **Al₂O₃** over the cooled surface of the molded **Na aluminate** to avoid unduly fast crystn. The **prepd. Na aluminate** block is uniform and the dissoln. time in wastewater is predictable. The block also has an insol. outer **layer** which is convenient for easy handling and storing. Thus, 32.7 kg of **Na aluminate soln.** contg. 20% Na₂O and 25% **Al₂O₃** was boiled in a tank at 117.degree. initially and concd. for approx. 2 h until reaching 134.degree. b.p. The concd. **soln.** was passed through a 3.6-cm diam. outlet of the tank for 2 min, poured into a mold (length 60, width 30, and thickness 16 cm) and cooled to 112.degree. after 30 min. Then, addnl. 0.25 kg of **Na aluminate** (particle diam. .gtoreq. 1 mm, .gtoreq.85%) was seeded over the surface of the cooled molded **soln.** The resulting **soln.** was heated to 125.degree., set within 1 h, and then was fully set by cooling for 3 h. The resulting block removed from the mold was cooled further at room temp. and contained 28% Na₂O and 33% **Al₂O₃**. A 25 kg **Na aluminate** block was immersed and gradually dissolved into a pH 2.5-3.0 wastewater stream at 2050 L/min in channels leading to 40,000 gal settling ponds. The **prepd. Na aluminate** block was fully dissolved in 6 h and the resulting effluent into the settling ponds had a pH 6.4-7.0.

IC ICM C01F007-04
ICS B01D009-02; C02F001-68
CC 60-2 (Waste Treatment and Disposal)
Section cross-reference(s): 49
ST **sodium aluminate** block wastewater treatment;
industrial acidic wastewater neutralization
IT Molding
(of **sodium aluminate**, for wastewater treatment,
concn. and seeding and crystn. for)
IT Wastewater treatment
(neutralization, of acidic effluent, **sodium aluminate**
block for, **prepn.** of)
IT 11138-49-1, **Sodium aluminate**
RL: PROC (Process)
(for **neutralization** of acidic wastewater from lagoon)

L80 ANSWER 6 OF 10 HCA COPYRIGHT 2003 ACS on STN

94:124070 Water-soluble basic aluminum salt **production**. (Sumitomo Aluminium Smelting Co., Ltd., Japan; Asahi Kagaku Kogyo K. K.). Jpn. Kokai Tokkyo Koho JP 55140718 19801104 Showa, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1979-45914 19790413.

AB An acidic compd. is partially neutralized by slow addn. of less than an equiv. of an basic compd., either or both being an Al compd., at -30.degree. to 10.degree. but to contain .gtoreq.5% **Al₂O₃** and to **form a gel**, and heated at 40-100.degree. to dissolve the **gel**. The **soln.** is readily filtrable from the residual **gel**. Thus, aq. AlCl₃ contg. 10.3% **Al₂O₃** 100 was mixed slowly with aq. **K aluminate** of K₂O/Al₂O₃ mol ratio 1.7 and contg. 0.1% **Al₂O₃** 47.8 parts both at -10 to -15.degree., heated at 60.degree. for 2 h (turbidity 390, 56, 22, and 11 after 0.5, 1, 1.5, and 2 h), and filtered to contain 10.2% **Al₂O₃** and basicity 50.3, vs. 9.7 and 47.1 when neutralized at 50-60.degree. (turbidity >1000) (very slow filtration).

IC C01F007-02

- CC 49-5 (Industrial Inorganic Chemicals)
ST aluminum basic chloride **manuf**; **potassium aluminate neutralization**
IT 1327-41-9P
RL: PREP (Preparation)
(**manuf.** of water-sol., aluminum chloride **neutralization** by **potassium aluminate** in)
IT 11137-59-0
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with aluminum chloride in aluminum basic chloride **manuf.**)
IT 7446-70-0, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with **potassium aluminum oxide**, in aluminum basic chloride **manuf.**)
- L80 ANSWER 7 OF 10 HCA COPYRIGHT 2003 ACS on STN
87:55204 Microbayerite. Ozaki, Hiromi; Yamane, Mamoru; Hiramatsu, Takanobu; Inoue, Yukio (Nippon Mining Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 51146393 19761215 Showa, 3 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1975-69726 19750611.
- AB Aq. Al salt or **Na aluminate soln.** is hydrolyzed in an ultrasonic field of >10 W/L of the **soln.** to obtain fine particles of bayerite useful for the **manuf.** of .eta.-**Al₂O₃**. Thus, 80 g **Na aluminate** was dissolved in water, filtered, placed in an ultrasonic field of 100 W at 50-5 kHz, mixed with concd. HNO₃ to adjust its pH to 8.5, filtered after 2 h, washed with water, dried at 150.degree. for 4 h to obtain bayerite of surface area 120.7 m²/g, and calcined at 500.degree. for 3 h to give .eta.-**Al₂O₃** having surface area 280.8 m²/g and pore vol. 0.214 mL/g with sharp distribution of pores of 15 .ANG. diam. In contrast, when it was not treated in ultrasonic field, noncryst. **Al₂O₃** having surface area 271.3 m²/g and pore vol. 0.204 mL/g with broad distribution of pores of 25 .ANG. diam. was obtained.
- IC C01F007-34
CC 49-3 (Industrial Inorganic Chemicals)
ST **sodium aluminate** hydrolysis bayerite; sound crystn bayerite
IT Sound and Ultrasound, chemical and physical effects
(bayerite fine crystals **formation** in field of)
IT 1344-28-1P, **preparation** 20257-20-9P
RL: PREP (Preparation)
(**manuf.** of fine crystals of, ultrasonic irradiation in)
IT 11138-49-1
RL: RCT (Reactant); RACT (Reactant or reagent)
(**neutralization** of, in ultrasonic field for bayerite microcrystals **formation**)
IT 1344-28-1P, **preparation**
RL: PREP (Preparation)
(**manuf.** of fine crystals of, ultrasonic irradiation in)
IT 11138-49-1
RL: RCT (Reactant); RACT (Reactant or reagent)
(**neutralization** of, in ultrasonic field for bayerite microcrystals **formation**)
- L80 ANSWER 8 OF 10 HCA COPYRIGHT 2003 ACS on STN
84:61937 Hydrated **alumina**. Kojima, Mitsuo (Nikki Chemical Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 50104798 19750819 Showa, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1974-10955 19740128.
- AB Aq. **Na aluminate** is **neutralized** with an

inorg. acid in the presence of tartaric acid or its salt. Thus, a **Na aluminate soln.** was mixed with Na tartrate and neutralized to pH 7 with HNO₃. The ppt., when filtered, suspended in H₂O at 50.degree., filtered, repeated twice more, dried at 120.degree. overnight, was 100% boehmite. A mixt. of gibbsite and boehmite was obtained without the tartrate.

IC C01F; B01J

CC 49-3 (Industrial Inorganic Chemicals)

ST boehmite; **sodium aluminate neutralization;**
tartaric acid aluminate

IT 87-69-4, uses and miscellaneous

RL: USES (Uses)

(boehmite **prepn.** in presence of from aluminate **soln**
.)

IT 1318-23-6P

RL: PREP (Preparation)

(**prepn.** of, by nutralizing aluminate **soln.** in
presence of tartaric acid)

L80 ANSWER 9 OF 10 HCA COPYRIGHT 2003 ACS on STN

84:19867 Homogeneous and fibrous hydrated **aluminum oxide**.

Horie, Chuichi; Hasegawa, Toshio; Suzuki, Hideyuki; Iwai, Takao; Kayama, Isao; Matsuda, Keizo; Fujita, Kazumi (Showa Tansan Co., Ltd., Japan).
Jpn. Kokai Tokkyo Koho JP 50062897 19750529 Showa, 3 pp. (Japanese).
CODEN: JKXXAF. APPLICATION: JP 1973-112830 19731009.

AB Aq. **Na aluminate** is heated in the presence of ethylene chlorohydrin (I). Thus, NaOH 1 and Al(OH)₃ 0.8 kg were dissolved in 3 l. H₂O, mixed with I 2 kg, the **soln.** heated for 5 hr and filtered, and the ppt. washed and dried at 90.degree.. The yield was 700 g of hydrated **Al₂O₃** with sp. surface 330 m²/g.

IC C01F

CC 49-2 (Industrial Inorganic Chemicals)

ST **alumina manuf** chlorohydrin hydrolysis

IT 1344-28-1P, **preparation**

RL: PREP (Preparation)

(from **sodium aluminate**, by **neutralization**
with ethylene chlorohydrin)

IT 107-07-3, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)
(hydrolysis of, **sodium aluminate**
neutralization by, **alumina** by)

IT 1344-28-1P, **preparation**

RL: PREP (Preparation)

(from **sodium aluminate**, by **neutralization**
with ethylene chlorohydrin)

L80 ANSWER 10 OF 10 HCA COPYRIGHT 2003 ACS on STN

78:32169 Macroporous extruded **aluminum oxide** of high

strength. Warthen, John L.; Briggs, Warren S.; Ciapetta, Frank G. (Grace, W. R., and Co.). Ger. Offen. DE 2214401 19721012, 20 pp. (German).
CODEN: GWXXBX. PRIORITY: US 1971-128422 19710326.

AB A NaAlO₂ **soln.** was neutralized with HNO₃ at 40.degree. to pH 8.5 to give an **Al₂O₃** ppt. which was dried at 104.degree. and granulated. The granules were powd. and partially calcined 3 hr at 649.degree.. H₂O was added to a mixt. of 90% calcined and 10% uncalcined **Al₂O₃** powder of av. particle size 100 .mu. to give a paste which was extruded to 0.312-cm strands. The strands were dried at 104.degree. and calcined 3 hr at 649.degree..

IC C04B; B01J

CC 49-3 (Industrial Inorganic Chemicals)

ST **aluminum oxide** macroporous extruded; porous
aluminum oxide

IT **1344-28-1P, preparation**

RL: PREP (Preparation)
(cellular, from **sodium aluminate** by
neutralization and extrusion)

IT **1344-28-1P, preparation**

RL: PREP (Preparation)
(cellular, from **sodium aluminate** by
neutralization and extrusion)

=> d L72 1-5 cbib abs hitind hitrn

L72 ANSWER 1 OF 5 HCA COPYRIGHT 2003 ACS on STN

104:7793 Method of manufacturing gibbsite. Seigneurin, Laurent (Rhone-Poulenc Specialities Chimiques, Fr.). Eur. Pat. Appl. EP 155873 A1 19850925, 10 pp. DESIGNATED STATES: R: BE, DE, FR, GB, IT, NL. (French). CODEN: EPXXDW. APPLICATION: EP 1985-400325 19850222. PRIORITY: FR 1984-3274 19840302.

AB A method of manufg. gibbsite with high sp. surface area is described. It consists of 3 steps. An alkali metal aluminate is reacted with HF at 5-95.degree.. The quantity of HF used is only 25-90% of the quantity necessary to neutralize the aluminate. The ppt. of Al(OH)₃ thus obtained is cured for 0.5-10 h at 5-95.degree.. Finally the ppt. is filtered, washed and dried. Thus, 2400 mL soln. contg. **Al₂O₃**, and Na₂O 1.5 mol was mixed with 2400 mL of HF soln. contg. 20 g HF/L. The HF content was 80% of the required quantity for **neutralization of Na aluminate soln.**

The mixt. was stirred for 2 h at 20.degree.. The ppt. was filtered, washed with 4 L H₂O and dried at 60.degree.. Thus 124 g of the Al(OH)₃ was obtained giving 79% yield of **Al₂O₃**. The sp. surface of the product was 90 m²/g.

IC ICM C01F007-14

CC **49-3** (Industrial Inorganic Chemicals)

IT 7664-39-3, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with **sodium aluminate**, in gibbsite
prepn.)

L72 ANSWER 2 OF 5 HCA COPYRIGHT 2003 ACS on STN

103:73343 Apparatus and method for continuous neutralization of an aluminate solution to form **gels**. Pearson, Alan; Fleming, Hubert L.; Larrousse, Mark F. (Aluminum Co. of America, USA). Eur. Pat. Appl. EP 147167 A2 19850703, 31 pp. DESIGNATED STATES: R: AT, BE, CH, DE, FR, GB, IT, LI, LU, NL, SE. (English). CODEN: EPXXDW. APPLICATION: EP 1984-308889 19841219. PRIORITY: US 1983-564291 19831222.

AB In a stirred reactor with a sparger mounted below the turbine stirrer (480-1000 rpm), **Al₂O₃ gel** is manufd. continuously. A

Na aluminate soln. with an **alumina**

-to-caustic ratio of 0.5-0.8 and contg. caustic (reported as Na₂CO₃) 50-150 g/L is neutralized with CO₂ at 0-90.degree. for 4-6 min residence time. The product is pseudoboehmite with a surface area of 440-475 m²/g, crystal size 21-22 .ANG., wt. loss at 110.degree. 1.15-2.69%, wt. loss on heating from 110 to 1100.degree. 25.0-29.7%, and Na₂O content 0.01-0.19%. The final pH and reaction temp. are controlled to obtain a product with specified properties.

IC ICM C01F007-14

CC **49-3** (Industrial Inorganic Chemicals)

ST boehmite manuf; **sodium aluminate**

- neutralization** carbon dioxide
- IT 1344-28-1P, preparation
RL: PREP (Preparation)
(gel, manuf. of, **sodium aluminate neutralization** with carbon dioxide in)
- IT 1318-23-6P 20257-20-9P
RL: IMF (Industrial manufacture); PREP (Preparation)
(manuf. of, **sodium aluminate neutralization** with carbon dioxide in)
- IT 124-38-9, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(**neutralization** by, of **sodium aluminate**, for **aluminum oxide gel**)
- IT 11138-49-1
RL: RCT (Reactant); RACT (Reactant or reagent)
(**neutralization** of, by carbon dioxide, for **aluminum oxide gel**)
- IT 1344-28-1P, preparation
RL: PREP (Preparation)
(gel, manuf. of, **sodium aluminate neutralization** with carbon dioxide in)
- IT 11138-49-1
RL: RCT (Reactant); RACT (Reactant or reagent)
(**neutralization** of, by carbon dioxide, for **aluminum oxide gel**)
- L72 ANSWER 3 OF 5 HCA COPYRIGHT 2003 ACS on STN
84:19877 .gamma.-Alumina of high activity. Yamaguchi, Naomi; Iwaisako, Toshiyuki (Asahi Chemical Industry Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 50087997 19750715 Showa, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1973-137057 19731208.
- AB Aq. **Na aluminate** is mixed with a halohydrin at room temp., heated above 50.degree., filtered, washed, dried, and calcined at 400-700.degree. for >30 min to obtain .gamma.-alumina of pore vol. 2-7 ml/g, sp. surface 370-470 m²/g, oil absorption 4-7 ml/g, bulk d. 0.06-0.25, and mean diam. 1-6.mu.. Thus, 1 l. of a 1.35% **Na aluminate soln.** (Al₂O₃:Na₂O = 1:1.144) was mixed with ClCH₂CH₂OH 19.8 g at 20.degree., and heated at 50.degree. for 1 hr. The ppt. was removed, washed with 10 l. H₂O, dried at 120.degree. for 3 hr, and heated at 400.degree. for 4 hr. The properties listed above were 4.9, 390, 4.5, 0.10, and 5.0, resp.
- IC C01F
CC 49-3 (Industrial Inorganic Chemicals)
ST **sodium aluminate** halohydrin **neutralization**; alumina high porosity
- IT 1344-28-1P, preparation
RL: PREP (Preparation)
(from **sodium aluminate** by **neutralization** with halohydrin)
- IT 1302-42-7
RL: RCT (Reactant); RACT (Reactant or reagent)
(**neutralization** of, with ethylene chlorohydrin, aluminum oxide by)
- IT 107-07-3, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(with **sodium aluminate**, aluminum oxide by)
- IT 1302-42-7
RL: RCT (Reactant); RACT (Reactant or reagent)
(**neutralization** of, with ethylene chlorohydrin, aluminum oxide by)

L72 ANSWER 4 OF 5 HCA COPYRIGHT 2003 ACS on STN

84:19876 .alpha.-Alumina of large surface and small bulk density. Yamaguchi, Naomi; Iwaisako, Toshiyaki (Asahi Chemical Industry Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 50087996 19750715 Showa, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1973-137056 19731208.

AB Aq. **Na aluminate** is mixed with a halohydrin at room temp., heated above 50.degree. filtered, washed, dried, and heated above 1000.degree. for >30 min to obtain .alpha.-alumina of sp. surface 10-100 m²/g, pore vol. 2-7 ml/g, oil absorption 2-4 ml/g, bulk d. 0.1-0.2, and mean diam. 1-7.mu.. Thus, 1 l. of a 1.35% **Na aluminate soln.** (**Al₂O₃:Na₂O = 1:1.144**) was mixed with ClCH₂CH₂OH 19.8 g at 20.degree., and heated at 50.degree. for 1 hr. The ppt. was removed, washed with 10 l. H₂O, dried at 100-150.degree. for 3 hr, and calcined at 1200.degree. for 3 hr. The properties listed above were 61, 4.5, 2.3, 0.15, and 4.2, resp.

IC C01F

CC 49-3 (Industrial Inorganic Chemicals)

ST alumina high porosity; **sodium aluminate** halohydrin **neutralization**

IT 1344-28-1P, preparation

RL: PREP (Preparation)

(from **sodium aluminate** by **neutralization** with halohydrin)

IT 1302-42-7

RL: RCT (Reactant); RACT (Reactant or reagent)

(**neutralization** of, with ethylene chlorhydrin, aluminum oxide by)

IT 107-07-3, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(with **sodium aluminate**, aluminum oxide by)

IT 1302-42-7

RL: RCT (Reactant); RACT (Reactant or reagent)

(**neutralization** of, with ethylene chlorhydrin, aluminum oxide by)

L72 ANSWER 5 OF 5 HCA COPYRIGHT 2003 ACS on STN

84:19875 .delta.,.theta.-Alumina of large surface and small bulk density. Yamaguchi, Naomi; Iwaisako, Toshiyuki (Asahi Chemical Industry Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 50087995 19750715 Showa, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1973-137055 19731208.

AB Aq. **Na aluminate** is mixed with a halohydrin at room temp., heated above 50.degree., filtered, washed, dried, and calcined at 700-1000.degree. for .gtoreq.30 min to obtain .delta.,.theta.-alumina of pore vol. 2-7 ml/g, sp. surface 100-370 m²/g, oil absorption 4-7 ml/g, bulk d. 0.06-0.26, and mean diam. 1-7 .mu.. Thus, 1 l. of a 1.35% **Na aluminate soln.** (**Al₂O₃:Na₂O = 1:1.144**) was stirred with 19.8 g ClCH₂CH₂OH, heated at 50.degree. for 1 hr, and cooled. The ppt. was removed, washed with 10 l. H₂O, dried at 120.degree. for 3 hr, and calcined at 700.degree. for 3 hr. The properties listed above were 4.8, 370, 5.0, 0.09, and 4.7, resp.

IC C01F

CC 49-3 (Industrial Inorganic Chemicals)

ST chlorohydrin **neutralization sodium aluminate**; aluminum oxide high porosity

IT 1344-28-1P, preparation

RL: PREP (Preparation)

(by **sodium aluminate neutralization** with halohydrin)

IT 1302-42-7

RL: RCT (Reactant); RACT (Reactant or reagent)
(**neutralization** of, with halohydrin, aluminum oxide by)
IT 107-07-3, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(with **sodium aluminate**, aluminum oxide by)
IT 1302-42-7
RL: RCT (Reactant); RACT (Reactant or reagent)
(**neutralization** of, with halohydrin, aluminum oxide by)

=> d L84 1-5 cbib abs hitind hitrn

L84 ANSWER 1 OF 6 HCA COPYRIGHT 2003 ACS on STN

136:343607 Processing of carbonaceous sludge from electrowinning of aluminum.
Baranovskii, V. V.; Baranovskii, A. V. (Aktzionernoe Obshchestvo Otkrytogo
Tipa "Vserossiyskii Alyuminievo-Magnievyi Institut", Russia). Russ. RU
2167210 C2 20010520, No pp. given (Russian). CODEN: RUXXE7.
APPLICATION: RU 1999-115190 19990713.

AB The carbonaceous sludge from wet cleaning of dust from Al-electrowinning
cells contains dispersed particles of C, fluorides, cryolite, and
Al2O3 with .ltoreq.40% moisture, and is processed with
neutralization of fluorides and cyanides as well as recovery of
Al2O3 and C. The C-contg. sludge is added to the charge contg.
Al2O3, soda, and limestone for **Al2O3** **prodn.**,
followed by heat treatment at >100.degree. in a furnace for sintering with
combustion of C, **formation** of Na or K
aluminates, and **neutralization** of sol.
fluorides and cyanides. The limestone is added to promote
formation of CaF2, 2CaO.SiO2, and CaF3.3CaO.2SiO2 (cuspidine).
The sintered **product** is leached for recovery of **Al2O3**,
soda, and K2CO3. The process is suitable for recovery of .apprx.90% of Al
and alkali metals contained in the starting materials, as well as for
environmental benefits.

IC ICM C22B007-00
ICS C01F007-38

CC 54-2 (Extractive Metallurgy)
Section cross-reference(s): 67

ST aluminum electrowinning cell carbon sludge sintering; **alumina**
recovery carbon sludge sintering leaching

IT 7429-90-5P, Aluminum, **preparation**

RL: IMF (Industrial manufacture); PREP (Preparation)
(electrowinning of; sintering of fluxed carbonaceous sludge from
Al-electrowinning cells)

IT 584-08-7P, Potassium carbonate 1306-00-9P, Cuspidine 7789-75-5P,
Calcium fluoride, **preparation** 10034-77-2P

RL: BYP (Byproduct); PREP (Preparation)
(from sludge; sintering and leaching of fluxed C-rich sludge from
Al-electrowinning cells)

IT 1344-28-1, **Alumina**, processes

RL: EPR (Engineering process); PEP (Physical, engineering or chemical
process); PROC (Process)
(recovery of; sintering and leaching of fluxed C-rich sludge from
Al-electrowinning cells)

IT 1344-28-1, **Alumina**, processes

RL: EPR (Engineering process); PEP (Physical, engineering or chemical
process); PROC (Process)
(recovery of; sintering and leaching of fluxed C-rich sludge from
Al-electrowinning cells)

L84 ANSWER 2 OF 6 HCA COPYRIGHT 2003 ACS on STN

- 104:212674 Removal of heavy metals from wastewaters. Herrmann, Volker; Imhof, Reinhold; Naegerl, Hans Dieter; Weyland, Franz (Giulini Chemie G.m.b.H., Fed. Rep. Ger.). Ger. Offen. DE 3438140 Al 19860424, 11 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1984-3438140 19841018.
- AB Wastewaters, esp. from power plants and heating plants with flue gas scrubbers, are intensively mixed with an aq. Na aluminate soln. with Na₂O-Al₂O₃ mol. ratio >1, and the heavy metal compds. ppt. at pH .gtoreq.7 and are removed from the water. Thus, 5 m³ desulfurization plant wastewater with pH 6.5 was mixed with Na aluminate soln. with Al₂O₃ content 19 wt.% and pH 14 to raise the pH to 7.3 and .apprx.30 min later, in the presence of polyacrylamide 0.5 mg/L, a sludge had settled out leaving an effluent which could be discharged without further treatment.
- IC ICM C02F001-62
- CC 60-2 (Waste Treatment and Disposal)
- IT Chlorides, uses and miscellaneous
Fluorides, uses and miscellaneous
Sulfates, uses and miscellaneous
Sulfites
RL: REM (Removal or disposal); PROC (Process)
(removal of, from flue gas desulfurization wastewater, coagulation and **neutralization with sodium aluminate** for)
- IT Flue gases
(wastewaters from scrubbing of, heavy metal removal from, **sodium aluminate neutralization-coagulation** for)
- IT Scrubbers
(wastewaters from, heavy metal removal from, **sodium aluminate neutralization-coagulation** for)
- IT Metals, uses and miscellaneous
RL: REM (Removal or disposal); PROC (Process)
(heavy, removal of, from flue gas desulfurization wastewater, coagulation and **neutralization with sodium aluminate** for)
- IT 9003-05-8
RL: PROC (Process)
(flocculant, in heavy metal removal from wastewaters by **sodium aluminate neutralization-coagulation**)
- IT 7429-90-5, uses and miscellaneous 7439-89-6, uses and miscellaneous
7439-92-1, uses and miscellaneous 7439-95-4, uses and miscellaneous
7439-96-5, uses and miscellaneous 7439-97-6, uses and miscellaneous
7440-02-0, uses and miscellaneous 7440-43-9, uses and miscellaneous
7440-47-3, uses and miscellaneous 7440-50-8, uses and miscellaneous
7440-66-6, uses and miscellaneous
RL: REM (Removal or disposal); PROC (Process)
(removal of, from flue gas desulfurization wastewater, coagulation and **neutralization with sodium aluminate** for)
- L84 ANSWER 3 OF 6 HCA COPYRIGHT 2003 ACS on STN
- 102:83403 **Manufacture** of oxidation-resistant carbon material.
(Mitsubishi Pencil Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 59190266 A2 19841029 Showa, 3 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1983-64554 19830414.
- AB High temp. oxidn.-resistant C materials are **manufd.** by immersing C material into an aq. Na aluminate soln., **neutralizing** the C material with acid, drying the material, and then firing in an oxidizing atm. Heat-resistant Al₂O₃ is filled in the pores of the C materials and the materials are esp. useful as electrodes, crucibles, and molds. Thus, a C material impregnated with NaAlO₂ was neutralized with dil. HCl soln., dried, and fired at

1050.degree. to give a C material filled with **Al₂O₃**. The material had 5.1% loss by oxidn. at 1050.degree., compared with 9.3 % for that not treated with Na aluminate.

IC C04B035-52

CC 57-8 (Ceramics)

IT 1344-28-1, uses and miscellaneous

RL: USES (Uses)

(impregnation with, in pores of carbon materials, for thermal oxidn. resistance)

IT 7440-44-0, uses and miscellaneous

RL: USES (Uses)

(materials, molded, **alumina** impregnation in, for thermal oxidn. resistance)

IT 1344-28-1, uses and miscellaneous

RL: USES (Uses)

(impregnation with, in pores of carbon materials, for thermal oxidn. resistance)

L84 ANSWER 4 OF 6 HCA COPYRIGHT 2003 ACS on STN

88:78920 Aluminum sulfate solutions. Deckelmann, Karl (Heraeus, W. C., G.m.b.H., Fed. Rep. Ger.). Ger. Offen. DE 2554218 19770825, 8 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1975-2554218 19751203.

AB Aq. Al sulfate **solns.** for water purifn. or wastewater treatment are **made** by reacring H₂SO₄-contg. Al sulfate **solns.** with sufficient alk. Na aluminate **solns.** that the Al sulfate **solns.** obtained have an Al content corresponding to 15-70 g **Al₂O₃/L** and a Na content corresponding to 2-65 g Na₂O/L. The starting **solns.** are waste **products**, and the alk. Na aluminate **solns.** contain .ltoreq.5% (calcd. on the aluminate) K compds. and (or) .ltoreq.5% Mg compds. The aq. Al sulfate **solns** . contain .ltoreq.50 g free H₂SO₄/L.

IC C01F007-74

CC 61-4 (Water)

Section cross-reference(s): 60

ST aluminum sulfate **manuf**; **sodium aluminate**

neutralizing; alum coagulant water treatment

IT Wastewater treatment

Water purification

(coagulation, aluminum sulfate **soln. manuf.** for)

IT 10043-01-3P

RL: IMF (Industrial manufacture); PREP (Preparation)

(**manuf.** of, for water purifn. and wastewater treatment)

IT 1302-42-7

RL: RCT (Reactant); RACT (Reactant or reagent)

(**neutralization** by, of sulfuric acid-contg. aluminum sulfate **solns.**)

IT 1302-42-7

RL: RCT (Reactant); RACT (Reactant or reagent)

(**neutralization** by, of sulfuric acid-contg. aluminum sulfate **solns.**)

L84 ANSWER 5 OF 6 HCA COPYRIGHT 2003 ACS on STN

67:35006 Adaptation of the Pedersen process to the ferruginous bauxites of the Pacific Northwest. Blake, Henry E., Jr.; Fursman, Oliver C.; Fugate, Arden D.; Banning, Lloyd H. Bureau of Mines Report of Investigations, No. 6939, 21 pp. (English) 1967. CODEN: XBMIA6. ISSN: 1066-5552.

AB The Pedersen process can be used to process ferruginous bauxites having a wide variation in SiO₂ content. The high Ti content of these materials does not affect the leachability of the Ca aluminate slags if extra CaO is added to **form** CaO.TiO₂. Smelting with lime and coke at

1750.degree. in an elec. arc furnace **produced** Ca aluminate slags in which .gtoreq.80% of the **Al2O3** was leachable by Na2CO3 **soln.** After a lime desilication of the **Na aluminate** leach liquors, **neutralization** of these **solns.** with CO2 resulted in pptn. of an **alumina** hydrate pure enough for calcination to cell-grade **Al2O3**. Recoveries of **by-product** Fe averaged >90%, but it contained .apprx.1.0% P. A slag contg. 14% SiO2 required a slower cooling rate than one contg. 7% SiO2 for **formation** of high percentages of **sol.** aluminates. High-SiO2 slags leached better at 23.degree. for long periods than at 65.degree. for shorter periods, but low-SiO2 slags leached well by either method.

- CC 54 (Extractive Metallurgy)
- ST BAUXITES FERRUGINOUS TREATMENT; FERRUGINOUS BAUXITES TREATMENT; ALUMINUM **PRODN**; IRON RECOVERY
- IT 7439-89-6P, **preparation** 7440-32-6P, **preparation**
RL: PREP (Preparation)
(from bauxite of Pacific Northwest by Pedersen process)
- IT **1344-28-1P, preparation**
RL: PREP (Preparation)
(from iron- and titanium-contg. bauxite of Pacific Northwest)
- IT **1344-28-1P, preparation**
RL: PREP (Preparation)
(from iron- and titanium-contg. bauxite of Pacific Northwest)